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Shuttle mission update

Shuttle program managers recently set new planning target launch dates for the next three Space Shuttle missions. Based on an assessment of the wiring work and preflight processing that remains on Discovery, Endeavour and Atlantis, managers set the following as target launch dates for upcoming flights:

Dec. 2, 1999 STS-103/Discovery Hubble Space Telescope Servicing-3A

January 13, 2000 STS-99/Endeavour Shuttle Radar Topography

Mission

February 10, 2000

(no earlier than) STS-101/Atlantis ISS Logistics/Assembly Flight 2A.2

Spaceport News

America's gateway to the universe. Leading the world in preparing and launching missions to Earth and beyond.

John F. Kennedy Space Center

KSC and AFVs: Leading the change



"When seen from space, the Earth is an extremely beautiful place."

Loren Shriver, KSC's deputy director of launch and payload processing, spoke these words to a gathering of national, state and local leaders on Oct. 1 at the Florida Solar Energy Center in Cocoa, Fla. The leaders gathered to designate the Florida Space Coast Clean Cities Coalition as the 75th member of the Department of Energy's Clean Cities Program.

The designation ceremony, held on the first day of October, marked the beginning of Energy Awareness Month. It also recognized the coalition for its commitment to using alternative fuel vehicles (AFVs) to curb air pollution from auto emissions and to help promote energy independence from foreign oil. Congratulating the coalition on behalf of Kennedy Space Center, Shriver took time to highlight the importance of taking care of the environment from a unique point of view — that of an astronaut.

"The amount of terrain that you can see [from space] is very im-

(See Clean Cities, Page 5)

Kids and computers: KSC takes technology to classrooms

Thirteen Brevard County schools are receiving 81 working computers, thanks to an innovative educational outreach project spearheaded by the NASA K-12 Education Services Office.

The Astronaut Memorial Foundation (AMF), a strategic partner in the effort, and several schools in rural Florida and Georgia also received refurbished computers as part of the year-long project.

While used computer donation programs are not unusual, what makes this project different is that the computers given have been

inspected, cleaned and upgraded to be able to run modern software, said Denise Coleman, educational outreach specialist with the Education Services Office.

The original idea for the project resulted from a survey of area schools Coleman sent out about a year and a half ago. The survey

(See Schools, Page 2)

As Kelly Coulson (center) listens to the keyboard while she plays it like a piano, Courtney Marquis (left) looks on and Michael Roberts (right) beams with excitement. They are three children in the kindergarten that recently received computers thanks to a NASA donation.



Schools ...

(Continued from Page 1)

showed many schools needed help with computers.

"Just offering them excess equipment isn't enough," said Coleman. "Too often donated computers just pile up against the wall in schools because they aren't in working order and the schools typically don't have staff with the technical expertise to repair the equipment. The missing link is the volunteer who knows how make them run."

KSC employees, primarily employees of the former USBI, put in about 3,300 volunteer hours to transform old, excess USBI computers into about \$90,000 worth of upgraded computer equipment.

"When children have access to computers, it's amazing how fast they learn to do so much with them," said Freemont "Freebie" Bassett, the lead volunteer for the project. "It's extremely rewarding to help them get access to a tool that can change their lives."

Bassett has made a hobby of rebuilding old computers for children whose families cannot otherwise afford a computer.

Because NASA was not legally able to accept the old USBI computers, the AMF took on the

project and donated space at the Center for Space Education for testing the equipment, replacing parts, installing software and matching up working units.

"We're only too happy to serve as a catalyst for this effort," said Kaylee Dominy, Education Program manager for AMF.

Children at the first schools to receive the refurbished computers on Oct. 1 tore into the protective plastic wrapping with their eyes aglow as if it were their birthdays.

"Computers help us learn," said Keyra Magee, a sixth-grade student in Michelle Butler's class at South Lake Elementary. "I think we'll get a better education because of them."

Units have been delivered by USBI, AMF and NASA employees to the following Brevard County schools: Coquina Elementary, Titusville; South Lake Elementary, Titusville; Cambridge Elementary, Cocoa; and Audubon Elementary, Merritt Island. Additional computers will be available to the following elementary schools: Saturn, Cocoa; Fairglen, Cocoa; Imperial Estates, Titusville; Atlantis, Cocoa; Riverview, Titusville; and Mila, Merritt Island; as well as to Madison Middle School, Titusville; Cocoa Beach High School and



Tamara Rutenber (right), technical specialist at Coquina Elementary School, was as excited as the children were at the delivery of computers from KSC, but their idea of gaining 'hands-on' experience was a bit more impulsive than hers.

Rockledge High School.

North and Central Brevard County schools were chosen through assessments completed by KSC volunteers and because several technology companies have programs to benefit schools in South Brevard.

In addition to the pilot project, NASA KSC also participates in the federal "Computers for Learning" program that offers excess computers to schools via Internet requests. The program follows an effort made more than a year ago to offer schools free used computer components through the Ransom Road excess location.

Public, private and home schools can access this program at Web site http://www.computers.fed.gov.

Coleman's next goal is to set up an ongoing computer refurbishment/repair program in conjunction with area colleges and universities.

Because a number of those schools feature computer repair classes, the volunteer work would be a great learning experience for students. A consortium is needed to keep the good work going that KSC employees started, Coleman said.

Disability Awareness and Action Working Group Fair

The Disability Awareness and Action Working Group (DAAWG) has planned a technology fair in conjunction with National Disability Employment Awareness Month. The theme this year is "Think Ability."

"Think Ability' appropriately reminds us to focus on the accomplishments of our friends and coworkers who may have a disability, but who also have the ability and the commitment to help KSC achieve its mission," said Sterling Walker, director of Engineering Development and chairperson of DAAWG.

The Technology Fair

will be held Oct. 20 in the lobby of Headquarters Building and Oct. 21 in the Operations Support Building lobby from 10 a.m. to 3 p.m. each day.

Some of the vendors participating this year include Canine Companions for Independence, Goodwill Industries, Accessible Structures Inc., Division of Blind Services, Space Coast Center for Independent Living, KSC Fitness Center and Delaware North Parks

Services.
All KSC employees
are encouraged to visit
one of the locations
and learn about the
types of technology
and services
available to
assist persons
with vision,

hearing, and mobility impairments. KSC employees' spouses or family members with disabilities may attend by contacting Gloria Johnson at 867-0834.

"DAAWG is committed to making KSC universally accessible to everyone," said Center Director Roy Bridges, "and I am very proud of the progress they have made in identifying and removing barriers that might hinder employees from performing at their full potential."

DAAWG advises the center director on matters relating to employees with disabilities and serves as a resource for the Equal Opportunity Program Office, the Administration Office and others.

For more information about DAAWG, visit the group's home page at http://www.ksc.nasa.gov/groups/daawg.

Days of Caring

Due to Hurricane Floyd, the seventh annual "Days of Caring" were postponed to Oct. 22 and 23.

During those days, KSC's NASA and contractor team will help spruce up Baxley Manor in Merritt Island and participate in a number of other projects around Brevard County. Baxley Manor is a building of low-income resident apartments for senior citizens. Find out more information about Days of Caring at http://www.uwbrevard.org.

Hispanics: Looking Forward to the 21st Century



KSC Director Roy Bridges (left) and the chief of KSC's Equal Opportunity Program Office, Ken Aguilar, enjoyed the artwork of four Hispanic artists displayed in the Galaxy Theater at KSC's Visitor Complex after the 15th annual "Meet Your Directors" luncheon on Oct. 8. The luncheon and the display of artwork were sponsored by the Hispanic Employment Program Working Group in celebration of Hispanic Heritage Month.

Mired in wire: workers perform intricate inspections





An electrical short during liftoff of Space Shuttle Columbia in July was traced to a wire in the payload bay with damaged insulation. As a result of that problem, NASA decided to inspect the wiring in all four Space Shuttles and make repairs as required. At left, technicians examined, repaired and protected the wires onboard orbiter Discovery on Sept. 23. Discovery is being readied to fly the next Shuttle mission (STS-103), which will be the third Hubble Space Telescope servicing mission, now targeted for Dec. 2. Above, a technician examines the wires onboard the orbiter Endeavour on Sept. 23. Endeavour is slated to fly the following mission, STS-99. That will be the Shuttle Radar Topography Mission, scheduled to launch Jan. 13, 2000.

Astronaut candidates at KSC



On Sept. 28, members of the 1998 astronaut candidate class (group 17) toured Kennedy Space Center, including Orbiter Processing Facility Bay 3, where they got a close-up look at the tiles under the orbiter Atlantis (above).

They also toured the Space Shuttle Main Engine Processing Facility (below), the Vehicle Assembly Building, the Space Station Processing Facility, the launch pads, the Shuttle Landing Facility, the Apollo/Saturn V Center and crew headquarters.

The class came to Kennedy Space Center for training activities, including fire training and a flight awareness program.

U.S. candidates include Clayton Anderson, Lee Archambault, Tracy Caldwell, Gregory Chamitoff, Timothy Creamer, Christopher Ferguson, Michael Foreman, Michael Fossum, Kenneth Ham, Patricia Hilliard, Gregory Johnson, Gregory Johnson, Stanley Love, Leland Melvin, Barbara Morgan, William Oefelein, John Olivas, Nicholas Patrick, Alan Poindexter, Garrett Reisman, Steven Swanson, Douglas Wheelock, Sunita Williams, Neil Woodward III and George Zamka.

International candidates are Leopold Eyharts, Paolo Nespoli, Hans Schlegel, Roberto Vittori, Bjarni Tryggvason and Marcos Pontes.



NASA licenses first KSC technology to international company

Kennedy Space Center, the starting point for many missions to the far reaches of space, has crossed a less distant commercial frontier.

A NASA-patented supersonic cleaning system technology developed at KSC has been transferred to a Dutch firm, marking the first time in KSC history that a U.S. patent owned by NASA has been licensed to a foreign company.

CryCle Cryogenic Development NV of Haarlem, The Netherlands, plans to develop and market the Gas/Liquid Supersonic Cleaning System, originally developed as a cleanliness verification tool to replace CFC-113 solvents.

Ron Barile, a scientist with KSC contractor Dynacs Engineering Co., said that traditional high-pressure spray systems use very large quantities of solvents.

Dr. Barile, who performed the technology's testing and vericiation, noted that disposal of these solvents creates an environmental problem, especially with the use of Freon 113 or other chlorofluorocarbons.

NASA's invention overcomes the deficiencies of prior systems. The cleaning spray system incorporates one or more converging-diverging nozzles to accelerate a gas-liquid mixture to a supersonic velocity for the cleaning of or contamination removal from various articles or components and uses less than 100 milliliters of water per minute.

The liquid — typically water — can be collected and sampled to verify cleanliness. It can also be easily adapted to accept virtually any gas-liquid mix and flow rate combination.

NASA's KSC inventors Eric Thaxton, Raoul Caimi and Gary Lin developed the technology for cleanliness verification of complex Space Shuttle mechanical and electronic parts. Caimi said the system is suitable for a variety of applications, from cleaning electronic circuit boards to scouring building exteriors.

Under negotiated terms of the patent license agreement, the company must substantially manufacture the system in the United States, and it is restricted to European marketing and sales

only

NASA inventors, as well as KSC, benefit from the collection of royalties that are negotiated as part of all patent license terms.

A formal license signing ceremony was held Aug. 27 in the office of Center Director Roy Bridges. CryCle Founder and Director Theodorus van Bakkum visited KSC for the signing.

CryCle Cryogenic is a small, high tech business, established by Van Bakkum in January 1997. CryCle had instituted partnerships with several American companies for other technological development and market support.

The company has successfully commercialized the Cryo-Beam, a cutting technology that uses highly pressurized liquid nitrogen to produce a dry, cold, fine beam which gives a surface cutting or abrading action while preserving underlying material, all without added waste.

Van Bakkum said his company is very interested in preserving natural resources as part of its business philosophy and in conformance with strict European environmental regulations.

He said KSC's cleaning system fits this category "because of the extremely low consumption of valuable potable water," since water is becoming a scarce and more expensive commodity all over the world.

"The NASA technology could help save enormous amounts of water used in all kinds of cleaning processes worldwide," Bakkum explained. "Instead of waterflushing for cleaning equipment, the process can be improved by using the supersonic technology, and large quantities of water will be saved in all kinds of industries, including food, pharmaceutical, chemical, and electronics."

The company plans to officially introduce the technology in March 2000 at the Hannover Messe 2000, the world's largest industrial fair in Germany, to European manufacturing and cleaning industries.

The first prototype should be ready in April

2000. Van Bakkum said his company estimates that it will take two years for the industries to convert to the supersonic cleaning system.

CryCle has initiated discussions with U.S. companies that have also licensed the technology for future cooperation in development and manufacturing and to explore mutual market opportunities to make the supersonic cleaning technology a worldwide success, he added.

There is no similar technology in Europe, and CryCle is optimistic that this will open up options in market segments outside of traditional cleaning industries. The first markets to be targeted include agriculture, food and pharmaceuticals.

Va-Tran Systems of Chula Vista, Calif., currently holds the U.S. patent rights and is marketing its own version of the cleaning system. Va-Tran found in further studies of the system that it is also excellent for removal of adhesive, flux, fingerprints and heavy hydrocarbon contamination.

Preferred Engineering, of Danbury, Conn., has also negotiated a license for the patent. Preferred specializes in customized solutions that support nuclear power plant refueling and maintenance.



Theodorus van Bakkum (left), founder and director of CryCle Cryogenic Development NV of The Netherlands, signed KSC's first international patent license on Sept. 23, as KSC Director Roy Bridges looked on.

Mark your calendars for the KSC/Cape Canaveral Air Station Open House

The 1999 KSC/Cape Canaveral Air Station Employee Open House is only three weeks away. The event is scheduled for Nov. 6 from 9 a.m. to 3 p.m., and the theme, "Space Partners Opening the Gateway to the Future," reflects the participation of Cape Canaveral Air Station (CCAS) as well as the Naval Ordnance Test Unit (NOTU).

KSC and CCAS employees and their guests will be admitted through Gates 2B, 2C, 3 and 4 at KSC and Gate 1 at CCAS. Each vehicle (no larger than a 15-passenger van) must contain at least one badged employee.

Plans call for access to several historic launch

complexes at CCAS, while the Cape Canaveral lighthouse will be available for external viewing only.

Visitors also will have a rare opportunity to tour the NOTU facilities near Port Canaveral.

OPEN HOUSE

At KSC, many of the most popular facilities are scheduled to be open, including the Shuttle Landing Facility and International Space Station Center. A driving tour of one of the pads at Launch Complex 39 also is planned.

Several astronauts will be on hand to greet visitors at locations as yet to be determined.

Food services and souvenir shopping will be available at several sites. In addition, there will be special discounts at KSC's Visitor Complex

for employees and their guests.

Brochures containing facility descriptions, route maps and other details will be distributed through

internal mail to KSC and CCAS employees

about a week before the event.

Check for updates at the Open House Web site http://kscinfo.ksc.nasa.gov/openhouse/

Clean Cities ...

(Continued from Page 1)

pressive," Shriver noted, commenting on his STS-31 mission. "Our orbit carried us up to the southern coastline of the U.S. and the Gulf Coast, and when we looked north several times coming through that part of the orbit, we could see well beyond the Great Lakes and into Canada from that vantage point."

Shriver pointed out that an orbiter's altitude and speed in space offer other interesting observations.

thereby substantially increase the use of alternative fuels. The area of Melbourne/Titusville/Kennedy Space Center was designated as one of six regions across the country in which the number of alternative fuel vehicles would be increased.

Indeed, Kennedy Space Center was recognized during the ceremony as one of the coalition's leading examples of expanding the use of alternative fuel vehicles and developing refueling capability.

"KSC's alternative fuel vehicle





At left, STS-31 Commander Loren Shriver, holding a HASSELBLAD camera, looks away from his Earth observation work on the aft flight deck of Discovery to smile for a fellow crewmember's snap shot. Above, this high oblique view of Madagascar, taken during that mission, shows that the majority of this Texas-sized island is now largely deforested and is suffering from severe soil erosion. That has led as well to declining biological species diversity. At the turn of the century, the island was almost totally forested, but now, forests cover only about 10 percent of the surface. Evidence of soil erosion can be seen in the offshore sediment plumes. Below, The Florida Space Coast Clean Cities Coalition logo represents nine Florida counties committed to using alternative fuel vehicles to curb air pollution from auto emissions and to helping to promote energy independence from foreign oil. More information about the coalition can be found at http://www.fsec.ucf.edu/env/fsccities.htm.

"When traveling roughly 18,000 miles an hour, you go around the Earth completely once every 90 minutes," he said. "This produces a new perspective on the size of the Earth; it effectively shrinks the size of the Earth, and you begin to get the sense that this is a little more fragile place than we're all accustomed to thinking about."

His comments punctuated the central point of the ceremony — promoting local government and industry partnerships to encourage and expand the use of alternative fuels. These partnerships should provide an expanding network to improve and maintain good air quality while conserving energy resources.

The ceremony was also the kickoff for the Federal Alternative Fuel Vehicle USER Program. This program is an interagency task force led by the U.S. Department of Energy and the General Services Administration (GSA) to increase the number of alternative fuel vehicles in federal fleets and



leadership within NASA supports NASA's top 10 position in the number of alternative fuel vehicles in federal agency fleets," Shriver pointed out, "and we're very proud of that fact."

H.T. Everett, chief, liquid propellants and fluids management, Logistics Directorate, pointed out that partnerships among NASA, the Department of Energy, the General Services Administration and industry resulted in KSC's state-of-the-art refueling facility and the deployment of 165 alternative fuel vehicles in KSC's fleet, which is

the largest of any NASA location.

Shriver noted that the designation of the Space Coast and central Florida area as the 75th Clean City dove-tails nicely with NASA's goals of education and technology advances without negative impact to

the environment.

"As we strive to make this area of Florida the number one launch choice in the world," he said, "we also realize the men and women who do that work want to live in a nice, healthy environment."

One of the space center's four guiding principles is environmental stewardship — particularly critical since KSC is located on the Merritt Island National Wildlife Refuge.

Transitioning KSC's ground tranportation vehicles to AFVs supports KSC's guiding principle, Shriver stated, and contributes to our nation's energy independence.

Shriver included in his remarks some personal observations he made during his three missions in space.

"In the midst of all this great scenery that's out there," Shriver pointed out, "is also great evidence that human beings have been waging war on the environment in several areas of the world, and the results are not good.

"The island of Madagascar off the east coast of Africa once was a really lush tropical island covered by forest," he said, "and in a matter of probably 20 to 30 years, just about everything on that island except what's up at the top of the high mountains on the eastern backbone of the island was cleared away. When you fly over it at the altitude that we were, you can see the entire island. And all the rivers that drain down from the mountains are just clogged with erosion...

"We have to remember to take care of the environment."

International Space Station starboard truss segment at KSC

The International Space Station starboard truss, which will become the backbone of the orbiting International Space Station (ISS), arrived on Oct. 6 at KSC's Shuttle Landing Facility aboard the "Super Guppy" transport aircraft. It was flown from a division of the Boeing Company in Huntsville, Ala.

This truss segment, designated 'S1,' is a 45-by-15 foot aluminum structure weighing 30,800 pounds when fully outfitted and ready for launch.

The primary function of S1 is to provide heat transport and heat rejection capability required for the International Space Station and to provide structural integrity for the outboard truss segments.

Scheduled for launch in the summer of 2001, astronauts will attach the S1 truss in space to the previously launched S0 truss.

During processing at KSC, the S1 truss will be outfitted with the thermal control radiators, the Crew and Equipment Translation Aid (CETA) cart, S-band communication equipment and external video equipment.

Additional items to be integrated at KSC include the command and data handling processors (C&DH), the Direct Current (DC) conversion units, and the Second-

ary Power Distribution Assemblies (SPDA). Once completed, the truss will undergo functional testing of integrated electrical and data



systems, which includes Multi-Element Integrated Tests.

The S1 truss was transported to the Operations and Checkout

Building, which has recently been reconfigured from processing Spacelab modules to processing ISS trusses.

Kennedy Space Center's Combined Federal Campaign is in full swing

The 1999 KSC Combined Federal Campaign (CFC) got off to a rousing start with a spirited kickoff on Oct. 1 in the Training Auditorium.

The gospel group "Remember Me" led all in attendance in a lively rendition of the national anthem.

Loren Shriver, KSC's deputy director for Launch and Payload Processing, and Barbara Brown, NASA's chief information officer at KSC, who chairs this year's



Above, Brenda Harris, executive director, Ex-change Club Center for the Prevention of Child Abuse (a.k.a. Yellow Umbrella), spoke at Kennedy Space Center's kickoff meeting for the Combined Federal Campaign on Oct. 1.

campaign, both challenged unit coordinators, key solicitors and the NASA at KSC workforce to rise to the occasion and once again show that "we are those who care" and that "we share!"

This year's guest speaker,
Brenda Harris, executive director,
Exchange Club Center for the
Prevention of Child Abuse (also
known as Yellow Umbrella), a
United Way of Brevard County
Member Organization, gave a
stirring set of remarks that reminded KSC employees where
their contributions go and just what
they can do.

The campaign has now reached the halfway point, and contributions are continuing to pour in. NASA employees can check the statistics for their own directorates and organizations by visiting the CFC Web site at http://cfc99.ksc.nasa.gov/. Links to the Web site can be found on the NASA KSC home page and employees' internal home page.

This year's campaign includes weekly prize drawings from the names of all contributors.

For people who have not contributed yet, but turn in their contribution forms by Oct. 20, they, along with all previous contribu-

tors, will be eligible for the third week drawing, the prize of which will be a \$50 gift certificate for the winner to spend at the NASA Exchange.

The fourth week's drawing will award four passes for the Kennedy Space Center Visitors Complex's Bus Tour and an IMAX Movie.

The drawings will culminate with a Grand Prize drawing at the conclusion of the campaign, which will award a \$100 gift certificate to the NASA Exchange, plus

two passes on the Center Director's bus for an upcoming Shuttle launch, as well as a photograph with the center director.





John F. Kennedy Space Center

Spaceport News

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